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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/043,457	01/10/2002	Joseph Bibb Cain	GCSD1195 (51244)	6465

27975 7590 02/13/2004

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EXAMINER

SCHEIBEL, ROBERT C

ART UNIT	PAPER NUMBER
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2666

DATE MAILED: 02/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/043,457

Applicant(s)

CAIN, JOSEPH BIBB

Examiner

Robert C. Scheibel

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,9,12-14,16,22,23,26-28,30,36,39-41,43,49 and 52 is/are rejected.
- 7) ☒ Claim(s) 2, 4-8, 10-11, 15, 17-21, 24-25, 29, 31-35, 37-38, 42, 44-48, and 50-51 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.
2. The disclosure is objected to because of the following informalities: in line 10 of paragraph 0059 on page 17, "For the example network 10 illustrated in FIG. 2" should be changed to "For the example network 10 illustrated in FIG. 1".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims **1-12 and 40-52** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The use of the phrase "available time slots" in claims 1 and 40 is vague. Lines 10-11 of claim 1 and lines 8-9 of claim 40 specify that at least one available time slot will exist. However, lines 13-14 of claim 1 and line 11 of claim 40 specify that at least 2N-1 available time slots exist. As long as N is greater than 0, these limitations are redundant. If the meaning of "available time slots" is intended to be different in each of these two cases, the examiner requests that the wording be changed to reflect this

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difference. For example, based on the specification, it appears as though the first instance refers to **unused** time slots and the second instance refers to the **total number** of time slots in a time frame. If the meaning of "available time slots" is intended to be the same in both instances, the examiner requests that one of the two limitations be removed to eliminate confusion.

Claims 2-13 and 41-52 are dependent upon claims 1 and 40, respectively, and are therefore rejected for the same reasons listed above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims **1, 3, 9, 12-14, 16, 22-23, 26-28, 30, 36, 39-40, 41, 43, 49 and 52** are rejected under 35 U.S.C. 103(a) as being unpatentable over "Medium access and radio resource management for ad hoc networks based on UTRA TDD" to Lott, et al in view of U.S. Patent 5,767,807 to Pritchett.

Regarding claims **1, 13, 27, and 40**, Lott discloses the step of scheduling a respective semi-permanent time slot in the third paragraph of section 5.1. In this section, Lott discloses reserving a small amount of capacity permanently. This is analogous to applicant's semi-permanent time slots. Lott further discloses the limitation of claims 1 and 40 that there be N semi-permanent slots and at least 2N-1 available slots. Consider the example when there are 2 pairs of nodes, each node using up a

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permanent connection ($N=2$). According to Lott, there are 60 time slots per super frame, so there would be much greater than $2N-1$ available slots. Lott discloses the step of scheduling the at least one available time slot based on communications demand in the third paragraph of section 5.1. Here, Lott indicates that when the user needs more capacity than is provided by the permanent connection, this channel is used to request additional capacity. It is also clear from the title, abstract and introduction that Lott is describing a method for use in an ad hoc network of mobile nodes.

Lott fails to disclose expressly that these mobile nodes are comprised of a transceiver, a phased array antenna, and a controller. Lott also fails to disclose expressly the step of aiming.

Pritchett discloses a directional (phased-array) antenna in figure 1. Pritchett also discloses the transceiver and the controller in the CPU 34 of figures 6 and 7. Pritchett discloses that the CPU 34 is used in transmitting and receiving a radio signal (transceiver) in lines 57-60 of column 6. Pritchett also discloses the aiming unit (claims 1 and 9) and the step of aiming (claims 17 and 25) in the CPU 34 of figure 7. Pritchett describes in 25-42 of column 7 that the CPU controls the direction of the antenna. Pritchett.

Lott and Pritchett are analogous art because they are from the same field of endeavor of mobile ad hoc networks. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the directional antenna, transceiver and processor of Pritchett to Lott. The motivation for doing so would have been to

provide the advantage of improved signal sensitivity and angular discrimination as suggested by Pritchett in the abstract.

Therefore, it would have been obvious to combine Pritchett with Lott for the benefit of improved signal sensitivity and angular discrimination to obtain the invention as specified in claims 1, 13, 27, and 40.

Regarding claims **14 and 28**, Lott discloses the limitation that there be N semi-permanent slots and at least $2N-1$ available slots. Consider the example when there are 2 pairs of nodes, each node using up a permanent connection ($N=2$). According to Lott, there are 60 time slots per super frame, so there would be much greater than $2N-1$ available slots.

Regarding claims **23 and 41** with the features of the parent claims addressed above, Pritchett discloses limitation of the directional antenna being a phased array antenna; the antenna of Figure 1 Pritchett (used in the rejection of the parent claims above) is a phased array antenna.

Regarding claims **9, 22, 36, and 49** with the features of the parent claims addressed above, Pritchett discloses the limitation of using an omni-directional antenna to exchange positional information in steps 1-4 of figure 11. Lott and Pritchett are analogous art because they are from the same field of endeavor of mobile ad hoc networks. At the time of the invention it would have been obvious to a person of ordinary skill in the art to add the omni-directional mode of Pritchett to Lott for the purpose of determining the location of other mobile nodes prior to setting the direction of the phased-array antenna. The motivation for doing so would have been to provide the

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advantage of improved signal sensitivity and angular discrimination as suggested by Pritchett in the abstract. Therefore, it would have been obvious to combine Pritchett with Lott for the benefit of improved signal sensitivity and angular discrimination to obtain the invention as specified in claims 1, 13, 27, and 40.

Regarding claims **12, 26, 39, and 52** with the features of the parent claims addressed above, Lott discloses the limitation of a plurality of communication links being established within a semi-permanent time slot where each link is to a different pair of nodes in the description of figure 4 at the top of column 2 on page 80. In the example, slot 12 is used to communicate with the pair S3-S1 and with the pair S3-S2.

Regarding claims **3, 16, 30, and 43** with the features of the parent claims addressed above, Lott discloses the limitation of scheduling time slots based on prioritization in section 5.5. If a request for high priority traffic arrives, it can use one of the reserved high priority time slots even if the remaining time slots are currently occupied.

Allowable Subject Matter

7. Claims **15, 17-21, 24-25, 29, 31-35, and 37-38** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim **2, 4-8, 10-11, 42, 44-48, and 50-51** would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this

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Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

"A New Approach to Channel Access Scheduling for Ad Hoc Networks" by Bao et al discloses a scheduling method in ad hoc networks.

U.S. Patent Application Publication 2003/0152086 by El Batt and "An Adaptive MAC and Directional Routing Protocol for Ad Hoc Wireless Network Using ESPAR Antenna" by Bandyopadhyay et al disclose the use of directional antennas in ad hoc mobile networks.

"A Five-Phase Reservation Protocol (FPRP) for Mobile Ad Hoc Networks" by Zhu and Corson and U.S. Patent Application Publication 2003/0067892 by Beyer et al also disclose mobile ad hoc networks.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert C. Scheibel whose telephone number is 703-305-9062. The examiner can normally be reached on 6:30-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema S. Rao can be reached on 703-308-5463. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RCS 2-5-04

Robert C. Scheibel
Examiner
Art Unit 2666

Seema S. Rao
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SUPERVISORY PATENT EXAMINER
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